

**UNITED STATES DEPARTMENT OF COMMERCE****United States Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

MF

MF

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
-----------------	-------------	----------------------	---------------------

09/219,195 12/21/98 LEE

F SA997115

WM01/0430

MONICA D LEE
IBM CORPORATION
INTELLECTUAL PROPERTY LAW
5600 COTTLE ROAD L2PA 0142
SAN JOSE CA 95193

EXAMINER

ALTMAN, F

ART UNIT

PAPER NUMBER

2652

DATE MAILED: 04/30/01

14

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

MF

Office Action Summary

Application No.

09/219,195

Applicant(s)

LEE ET AL.

Examiner

Franklin D. Altman

Art Unit

2652

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 February 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☒ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) g.
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

DETAILED ACTION

Request for Continued Examination

The request filed on 2/5/2001 for continued examination based on parent Application No. 09219195 is acceptable and an RCE has been established. An action on the RCE follows.

Prior Election

1. An election made in the prior application carries over to the RCE only if all of the following conditions are met: (1) the RCE is designated as a continuation or is not designated at all (i.e. the RCE is NOT designated as a divisional); (2) there was an express election by the applicant in reply to a restriction requirement in the prior application; (3) the RCE presents claim(s) drawn only to invention(s) claimed in the prior application; and (4) the RCE does not contain an indication that a shift in election is desired.
2. In response to the restriction requirement:
3. Applicant expressly elected Group II in the prior application, paper 6, received on 10/16/2000.
4. Accordingly, prosecution is being continued on the invention elected and prosecuted by Applicant in the prior application.

Claim Objections

Claims 14, 17, 21, 24, 27, 31 and 34 are objected to because of the following informalities: They all recite an awkward expression "such that the connecting end...being positioned" without an object of the verb positioned, leading the reader to wonder, positioned

Art Unit: 2652

where? A better expression would replace "being" with - - is - -, yielding - -such that the connecting end...is positioned - -. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

1. Claims 14-17, 21-30, and 38-41 are rejected under 35 U.S.C. 102(e) as being anticipated by Arya et al (U.S. Patent 6,055,132).

As per claim 14:

Arya et al discloses a suspension assembly (Figure 3) including:

A slider/head assembly (100) having a connecting end (below 102 in Figure 3);

A suspension (110) having a connecting end (120) and electrically conductive paths (140, 141);
and

An interconnect module (104) coupling the connecting ends (120, below 102) of the suspension and the slider/head assembly (100) to route one or more data signals (68) between said electrically conductive paths (140, 141) and said slider/head assembly (100), such that the connecting end (120) of the suspension being position in a first direction (Figure 3) and the connecting end of the slider/head assembly being positioned in a second direction (Figure 3).

As per claims 15, 25, 28:

Art Unit: 2652

Arya et al' suspension (110) is an integrated lead suspension ("electrically attached", column 8, line 3).

As per claim 16, 26, 29:

Arya et al' suspension (110) is configured for in-line mounting ("symmetrically disposed", column 7, line 4) of said slider/head assembly (100).

As per claim 17, 30:

Arya et al's slider/head assembly (100) is orthogonally mounted (Figure 3) onto said suspension (110).

As per claim 21:

Arya et al disclose an assembly (Figure 3) including:

A first device (100) having a connecting end (below 102 in Figure 3);

A second device (110) having a connecting end (120) and electrically conductive paths (140, 141); and

An interconnect device (104) coupling the connecting ends (below 102 in Figure 3, 120) of the first and second devices to route one or more signals (68) between said first device (100) and said electrically conductive paths (140, 141), such that the connecting end (below 102) of the first device being positioned in a first direction (Figure 3) and the connecting end of the second device being positioned in a second direction (Figure 3).

As per claim 22:

Arya et al disclose the first device (100) is a slider/head assembly (100) and said second device (110) is a suspension (110);

As per claim 23:

Art Unit: 2652

Arya et al discloses the first device (104) is a microactuator (104) and the second device (110) is a suspension (110).

As per claim 24:

Arya et al discloses a storage device (Figure 2) including:

A disk (12);

A spindle motor (14) positioned to support and rotate said disk (12);

A suspension assembly (34) including an interconnect module (104) between a slider/head assembly (52/ 100) having a connecting end (below 102 in Figure 3) and a suspension (50 / 110), said suspension (110) having a connecting end (120) and electrically conductive paths (140, 141), the interconnect module (104) coupling the connecting ends (below 102, 120) of the slider/head assembly (100) and the suspension (110) routing one or more data signals (68) between the electrically conductive paths (140, 141) and said slider/head assembly (100), such that the connecting end (120) of the suspension (110) being positioned (Figure 3) in a first direction and the connecting end of the slider head assembly being positioned (Figure 3) in a second direction; and

An actuator (40) coupled to said suspension assembly (34) and operable to position said suspension assembly (34) above said disk (12) to access said disk (12) for reading and/or writing operations. (Figure 2)

As per claim 27:

Arya et al discloses a test platform (10) for disks (12). Inherently, Arya's system (10) is a test platform in that each time a read or write operation is attempted it would likely succeed or pass but could fail.

Art Unit: 2652

Arya et al' test platform (10) includes:

A spindle motor (14) for rotating a disk (12) during a test operation (read/write operation); and

A test platform (10) including a suspension assembly (34) coupled to an actuator (40), said actuator (40) operable to position said suspension assembly (34) above said disk (12) to access said disk (12) for said test operation (read/write operation), said suspension assembly (34)

including an interconnect module (104) between a slider/head assembly (100) having a connecting end (below 102) and a suspension (110), the suspension (110) having a connecting end (120) and electrically conductive paths (140, 141), the interconnect module (104) coupling the connecting ends (below 102, 120) of the slider/head assembly and the suspension and routing one or more data signals (68) between the electrically conducting paths (140, 141) and the slider/head assembly (100), such that the connecting end (120) of the suspension (110) being positioned in a first direction (Figure 3) and the connecting end (below 102) of the slider/head assembly (100) being positioned in a second direction (Figure 3).

As per claims 38-41:

Arya et al additionally disclose wherein said electrically conducting paths (40, 41) are attached (Figure 3) to said second device (110).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2652

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 18-20, 31-37, 42 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arya et al in view of Koshikawa et al (U.S. Patent 6,181,531 B1).

As per claim 18:

Arya et al discloses a suspension assembly (Figure 3) including:

A slider/head assembly (100);

A suspension (110) having a connecting end (120) and electrically conductive paths (140, 141);

and

A microactuator (104) having a connecting end (105).

Routing one or more data signals (68) between said electrically conducting paths (140, 141) and the microactuator (104).

But lacks an explicit teaching of

An interconnect module coupling the connecting ends (120, 105) of the suspension (110) and the microactuator (104).

However, Koshikawa et al discloses:

An interconnect module (42) coupling the connecting ends (43) of the suspension and the microactuator (41 / 131,132).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the interconnect module (42) disclosed by Koshikawa et al to the connecting ends of the suspension and microactuator of Arya et al. The rationale is as follows: one of

Art Unit: 2652

ordinary skill in the art would have been motivated to add the interconnect module to better form and connect wires and terminal pads, column 6, lines 39 and 40, Koshikawa et al.

As per claim 19:

Note the rejection of claim 15 above.

As per claim 20:

Arya et al' suspension (110) includes a first set of termination leads (below 102) coupled to a slider/head assembly (100) but lacks a second set of termination leads (122) coupled to an interconnect module.

However, Koshikawa et al disclose a second set of termination leads (leads/pads of 42) coupled to an interconnect module (42).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the interconnect module (42) and second set of termination leads (leads/pads of 42) disclosed by Koshikawa et al to the connecting ends of the suspension and microactuator of Arya et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to add the interconnect module to better form and connect wires and terminal pads, column 6, lines 39 and 40, Koshikawa et al.

As per claim 31:

Arya et al disclose a storage device (10) including:

A disk (12);

A spindle motor (14) positioned to support and rotate said disk (12);

A suspension assembly (34) including coupling between a suspension (110) having a connecting end (120) and electrically conductive paths (140, 141) and a microactuator (104) having a

Art Unit: 2652

connecting end (105) and a coupling of the connecting ends (below 102, 120) of the suspension and the microactuator, such that the connecting end (120) of the suspension (110) being positioned in a first direction (Figure 3) and the connecting end (below 105) of the microactuator being positioned in a second direction (Figure 3).

An actuator (40) coupled to said suspension assembly (34/110) and operable to position said suspension assembly (34) above said disk (12) to access said disk (12) for reading and/or writing operations (68), but lacks an explicit teaching of an interconnect module for coupling the connecting ends (120, 105) of the suspension (110) and the microactuator (104).

However, Koshikawa et al disclose:

An interconnect module (42) coupling the connecting ends of the suspension (43) and the microactuator and routing the data signal between electrically conductive paths and the microactuator (41 / 131, 132).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the interconnect module (42) disclosed by Koshikawa et al to the connecting ends of the suspension, electrically conductive paths and microactuator of Arya et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to add the interconnect module to better form and connect wires and terminal pads, column 6, lines 39 and 40, Koshikawa et al.

As per claim 34:

Arya et al discloses a test platform (10) for disks (12). Inherently, Arya et al' disk drive is a test platform in that each time a read or write operation is attempted it would likely succeed or pass but could fail.

Arya et al' test platform (10) includes:

A spindle motor (14) for rotating a disk (12) during a test operation (read/write operation); and
A test platform (10) including a suspension assembly (34) coupled to an actuator (40), the actuator (40) operable to position said suspension assembly (34) above said disk (12) to access said disk (12) for said test operation (read/write operation), said suspension assembly (34) including coupling between a suspension (110) having a connecting end (120) and electrically conductive paths (140, 141) and a microactuator (104) having a connecting end (105) coupling the connecting ends (120, 105) and routing one or more data signals (68) between the electrically conductive paths (140, 141) and the microactuator (104), such that the connecting end (120) of the suspension (110) being positioned in a first direction (Figure 3) and the connecting end (105) of the microactuator (104) being positioned in a second direction (Figure 3).

Arya et al lack an explicit teaching of an interconnect module for coupling and routing.

However, Koshikawa et al disclose:

An interconnect module (42) for coupling and routing.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add the interconnect module (42) disclosed by Jabbari et al to the connecting ends of the suspension, electrically conductive paths and microactuator of Arya et al. The rationale is as follows: one of ordinary skill in the art would have been motivated to add the interconnect

Art Unit: 2652

module to better form and connect wires and terminal pads, column 6, lines 39 and 40,

Koshikawa et al.

As per claims 32 and 35:

Note the rejection of claim 15 above.

As per claims 33 and 36:

Note the rejection of claim 16 above.

As per claim 37:

Arya et al additionally disclose wherein the microactuator is orthogonally mounted (Figure 3).

As per claims 42 and 43:

Note the rejection of claim 38 above.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

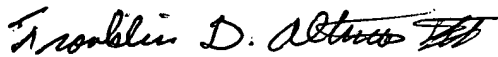
Delacou (U.S. Patent 4,737,872) disclose in Figure 3, a pioneering round robin servo coupling of high density electrical connection in a disc drive. Zhang et al (U.S. Patent 6,122,149) disclose microactuator coupling in Figure 11. Crane et al (U.S. Patent 6,078,473) disclose microactuator leads in Figure 10. Amemiya et al (U.S. Patent 6,002,550) in Figure 10 disclose a coupling of a slider to electrical paths. Arisaka et al (U.S. Patent 6,069,774) disclose disk drive similar to Simmons et al of record. Boutaghou et al (U.S. Patent 5,943,189) disclose a piezoelectric microactuation of a disc drive.

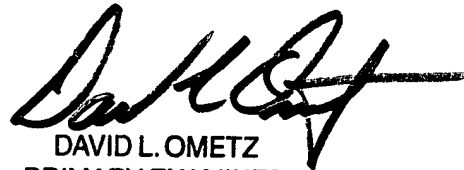
Palmer et al (U.S. Patent 5,668,684) disclose electrical interconnect to an actuator assembly. Berding et al (U.S. Patent 5,781,38) disclose electrical connectors in a disc drive. Young (U.S. Patent 5,717,547) disclose an electrical interconnect in a disc drive. Kudo et al (U.S. Patent 5,657,186) disclose grounded electrical connection to a read head. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Franklin D. Altman whose telephone number is (703) 305-7494. The examiner can normally be reached on m-th, 6:30 am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Nguyen, can be reached at (703) 305-9687.

The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-9021 for formal communications or (703) 308-90511 for informal communications, which should be so designated.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.


Franklin D. Altman, III


DAVID L. OMETZ
PRIMARY EXAMINER